

WABCO

TRAILER EBS INSTALLATION GUIDELINES



WABCO Proudly Supported in New Zealand by Gough Transpecs & Gough TWL

New Zealand, October 2017



Please note:

The system installation must be commissioned by a qualified WABCO technician before the trailer enters service.

**Contact Gough Transpecs customer service
for assistance on 0800 875 669**

Notes

Safety Information



WARNING

Damage to the TEBS E Modulator caused by not using original WABCO cables

Using cables not authorised by WABCO may result in functional impairments and fault entries.

Cables with open ends must be laid in manner that ensures no water can enter the modulator via the cables to damage it.

- Only use original WABCO cables.



WARNING

Dangerous voltages during electrostatic painting and welding

Dangerous voltages can damage the electronic control unit.

- If electrostatic painting or welding work is carried out on the vehicle, the following measures must be implemented:

Moving or insulated components (such as axles) must be conductively connected to the vehicle frame (chassis) using suitable earth terminals to ensure that no potential differences are allowed to build up and cause a discharge. or

The ABS connection lines on the modulator must be disconnected and the electrical terminals covered (with sealing plugs for example).

- Ground connections for welding and paint spray systems must always be connected on the parts that are being worked on.

CAUTION

Damage to the TEBS E Modulator due to painting over

Connector locks and plastic pipes of the pneumatic couplings can no longer be released after painting.

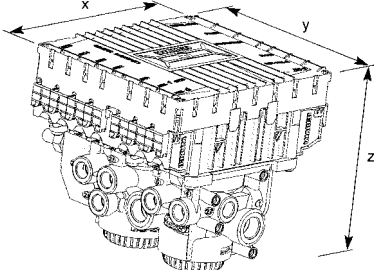
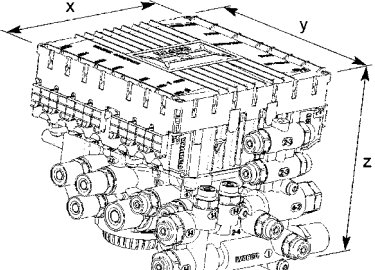
- Do not paint over the modulator.

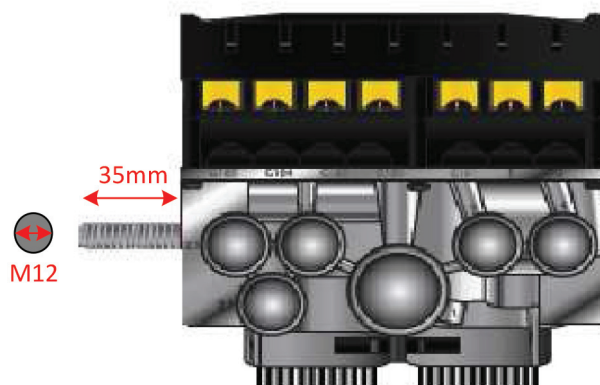
Data on the TEBS Modulator

Technical data of the TEBS E Modulator (Premium, Standard, Multi-Voltage)

Permissible maximum temperature (baked finish)	+65 °C permanent; +110 °C for 1 hour with no function
Reverse polarity protection	The system is protected against reverse polarity of the towing vehicle battery.
Undervoltage (terminal 30, terminal 15, 24N)	< 19 V (9.5 V Multi-voltage in 12 V operation)
Overvoltage (terminal 30, terminal 15, 24N)	> 30 V
Nominal voltage (terminal 30, terminal 15, 24N)	24 V (12 V Multi-Voltage in 12 V operation)
Operating pressure	min. 4.5 to 8.5 bar, max. 10 bar

Dimensions of the TEBS E Modulator

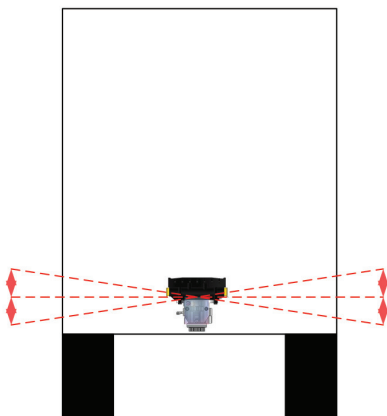
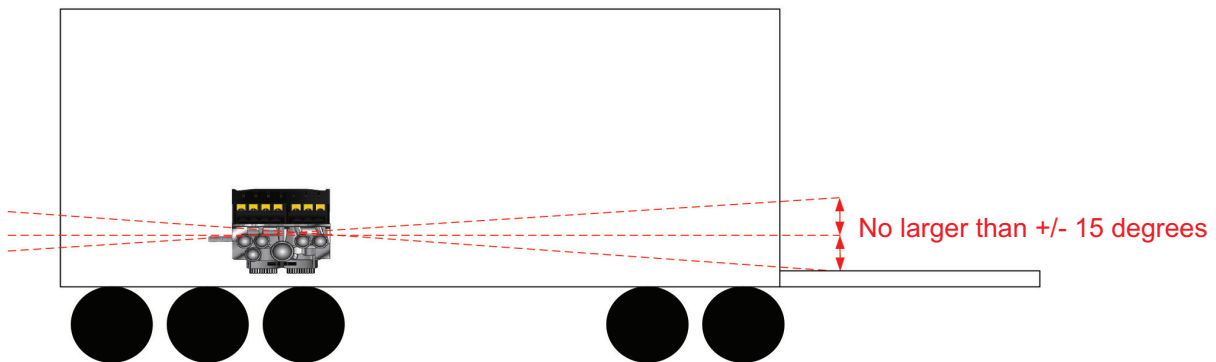
TEBS E MODULATOR WITHOUT PEM	TEBS E MODULATOR WITH PEM
 <p>Width X: 224.0 mm Depth Y: 197.5 mm Height Z: 197.3 mm</p>	 <p>Width X: 224.0 mm Depth Y: 254.0 mm Height Z: 197.3 mm</p>



Installation in vehicle



ECU closest to the centre of the group as possible



Angle must be no larger than +/- 3 degrees

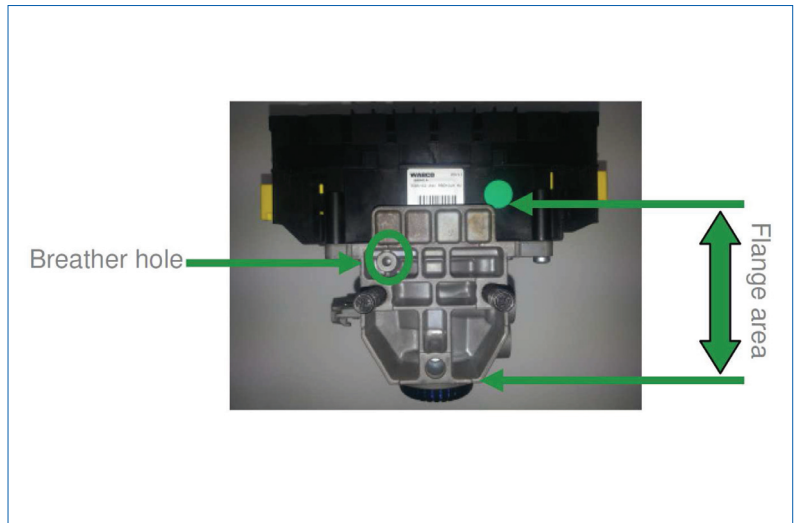
- Try to keep the modulator as close to the centre of the axle group as possible
- WABCO recommends the difference between the shortest and longest brake chamber hose is no larger than 500mm
- The ECU may face bolts forward or bolts backward of driving direction
- The ECU may be mounted up to 500mm off centre of middle of the chassis

Installation in vehicle continued

Important Installation Information:

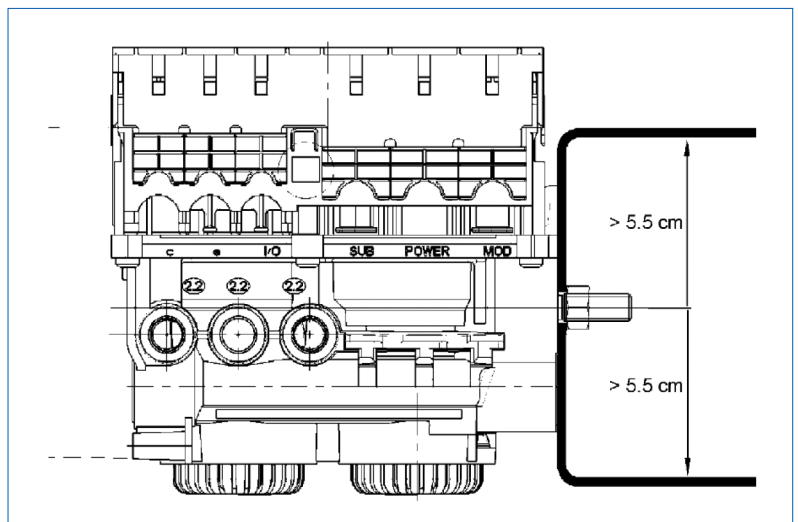
The bearing surface must be supported this way for two reasons:

1. Minimise the risk of vibration when mounted to the vehicle frame
2. Protect the internal breather port (shown at right)



Mounting on cross member

The cross-member must be connected to the two longitudinal beams of the vehicle mass in a friction locked manner.



Installation in vehicle continued

Earth Connection

Note: Ensure there is a good earth connection between the valve and the vehicle frame. This helps to disperse any electrostatic discharge.

Pull Test

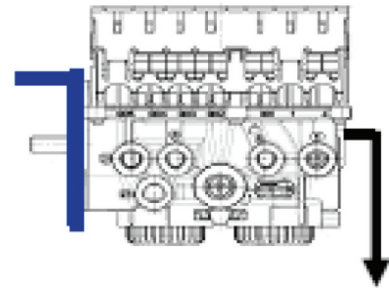
To assess the stability of the mounting construction a pull test can be performed. This is done using a static weight temporarily loaded to the modulator.

- Mount the TEBS E in the desired location.
- Screw a fitting into port 1 of the modulator which can be used as a hook.
- Measure the height of the hook in relation to the frame.
- Carefully hang 80kg weight on to the hook.
- Measure the deflection of the support bracket.

Result:

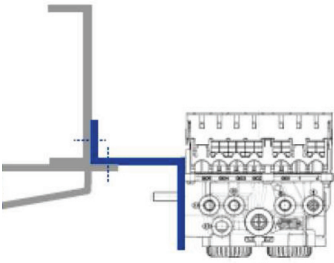
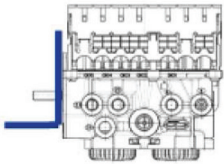
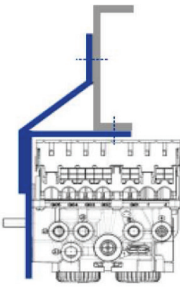
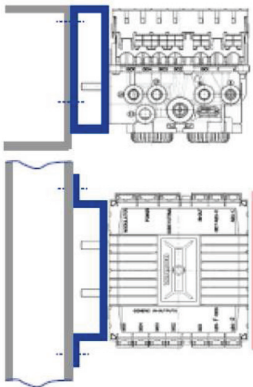
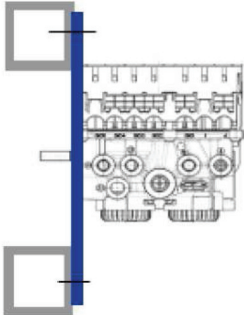
Deflection <2.5 ... 4 mm = ok.

Deflection >4mm = too weak, not acceptable.



Excessive deflection will result in strong vibrations during travel with the risk of damage to the system.

Installation in vehicle continued

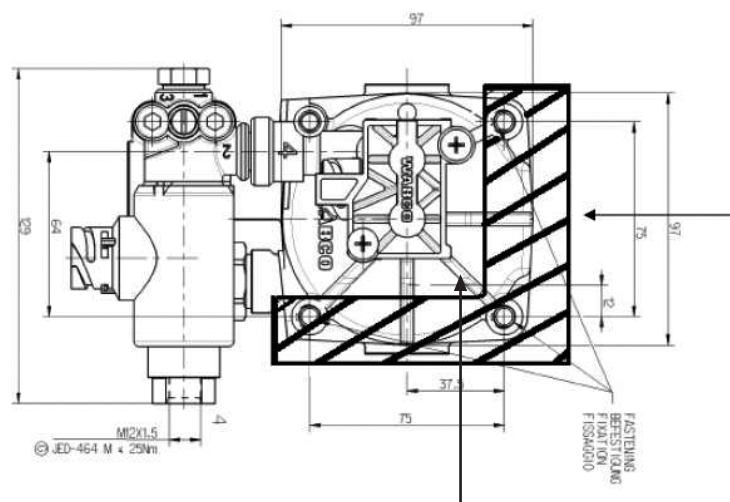
	<p>Pull test bending more than 4mm High vibration between modulator and fixations</p> <p>X</p>
	<p>Pull test bending more than 4mm High vibration between modulator and fixations</p> <p>X</p>
	<p>Pull test bending 2mm 5mm sheet metal - lower vibrations</p> <p>✓</p>
	<p>Pull test bending < 1mm 6mm sheet metal - minimal vibration</p> <p>✓</p>
	<p>No bending 8mm sheet metal - minimal vibration</p> <p>✓</p>

A detailed view of a mechanical component, likely a valve or actuator, showing various ports, a central body, and a base. Several arrows point to specific features: one points to a top port, another to a side port, and a third to the base.

There are four caps screws used to clamp the valve body to the top housing. Three of these cap screws are extended to provide a mounting connection.

The exhaust port must be facing down and the installation must not deviate more that $\pm 15^\circ$ from the vertical plane.

Fig.1: 480 207 001 0 & 480 207 202 0.



A supporting bracket must be fabricated so the 3 extended bolts are used to secure the valve.

Failing to do so may cause premature failure through vibration.

- Ensure bracket does not pinch on the web of the valve.

Note: Ensure there is a good earth connection between the valve and the vehicle frame. This helps to disperse any electrostatic discharge.

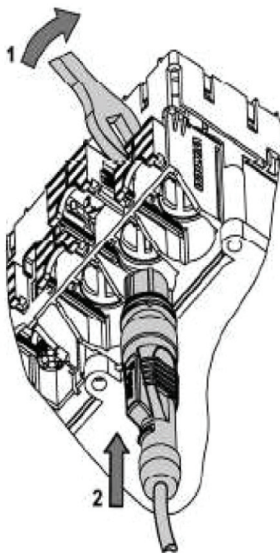
Welding on vehicle

NB: Any sort of arc welding can cause damage to an ECU fitted to a trailer. The inverter that we supply is also susceptible to damage from welding arcs.

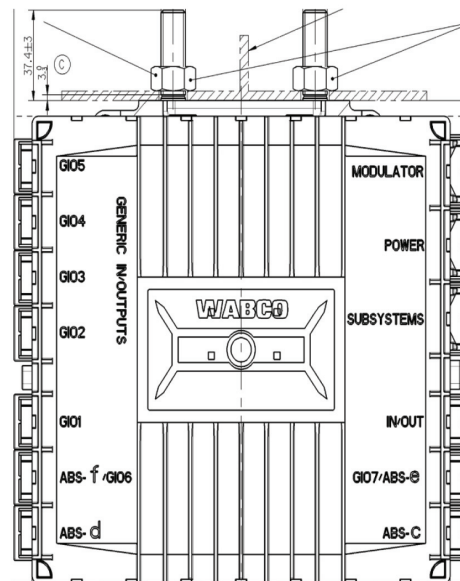
Prevention is less costly than the cure.

Please follow the following recommendation from WABCO for all ABS and EBS models:

1. Remove all the main power cables and diagnostic cables from the ECU as they have non interchangeable connections.
2. Leave the sensor cables that are plugged into the ECU and disconnect them at the wheel end. This will cover the protection against welding, and at the same time will prevent mixing them up at the ECU end.



Above: WABCO TEBS E Modulator - Plugs and dismantling of cables and protective caps.



Above: Diagram of a WABCO ECU.

Note:

When undoing locking clips on the modulator, push the plug up into the unit to take pressure off the clip then using a spanner lever the yellow locking clip out as shown above.

Cable installation / cable fastenings

CAUTION

Damage to the cable

- Water that enters the cable core can damage the TEBS E Modulator. Only use original WABCO cables. Using cables of third party manufacturers will render any claims for consequential damage invalid.
- Plan your installation position so that cables cannot become kinked.
- Fasten the cable and plug so that no tension or lateral forces affect the plug connections.
- Never route cables over sharp edges or in the vicinity of aggressive media (e.g. acids).
- Route the cable to the connections so that water cannot enter the plug-in connector.

Cable- / dummy cap installation

Figure 1

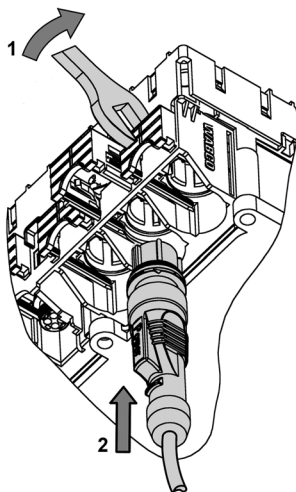
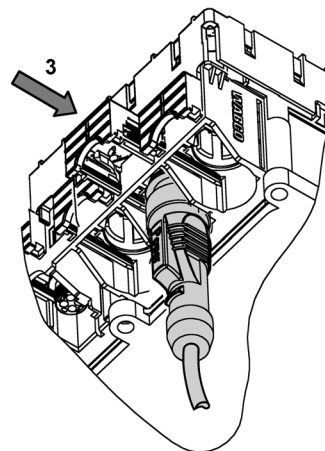


Figure 2



- Open the yellow slider for the lock before you can insert or remove the cable end sockets (socket housing) into the respective slot on the ECU frame.
 - If the slider is in the locked end position (condition at delivery), you can use a size 13mm open-end spanner to release the notch from either the top or from below (Figure 1, Position 1).
- Then pull out the slider up to the cover end stop by hand in order to permit access to the connector guide.
- Insert the cable ends (or the dummy cap) vertically on the respective slot of the ECU (e.g. power cable to POWER connection).
 - 8-pin cable for POWER, SUBSYSTEMS and MODULATOR to GIO10-12
 - 4-pin cables for GIO1-7, ABS c, d, e and f, IN/OUT to GIO13-18
 - Ensure that the correct polarity and coding (connector to slot) is adhered to. They can only be inserted if the two parts match.

Cable installation / cable fastenings continued

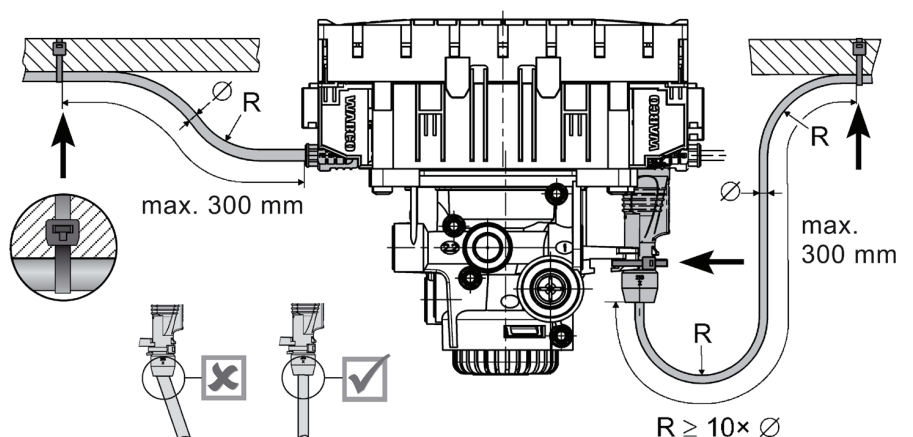
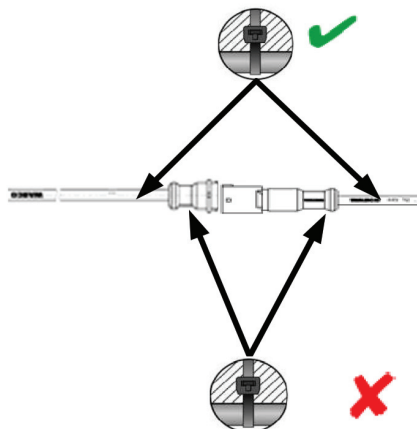
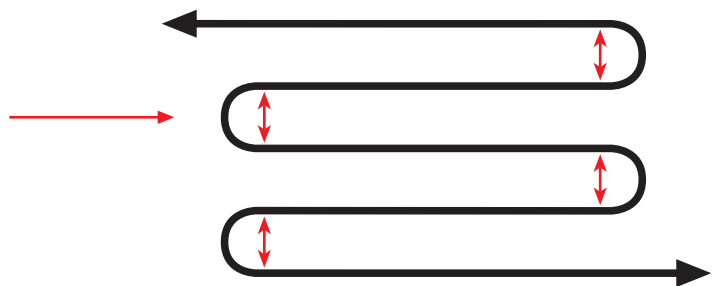
CAUTION	Damage to the power cable To avoid damaging the connector when the cable is pulled through, the connector is enclosed by a protection cap. <ul style="list-style-type: none">- Carefully remove the protective cap when connecting the cable to the ECU so that the seal will not be damaged or slip.
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Cable fixation

CAUTION	Damage to the cable <ul style="list-style-type: none">- Fasten the cable ties so that the cable is not damaged.- When using tools, please note the instructions of the cable-tie manufacturer.- If the cables are too long, do not wrap them up, route the cables in through loops, see following diagram.
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Spare cable must be folded on itself ensuring the radius of the cable folds are no tighter than 10 x the diameter of the cable.

I.e. Minimum fold size
Power cable = 110mm
Wheel speed sensor cable = 50mm
3rd modulator cable = 80mm

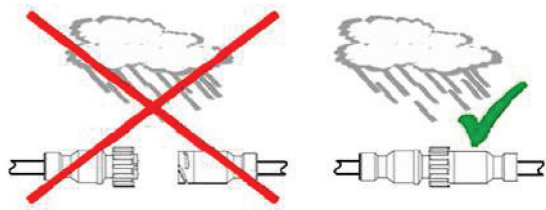

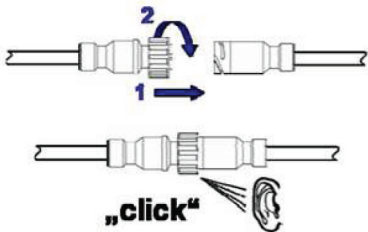
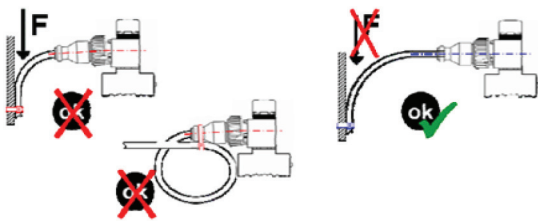
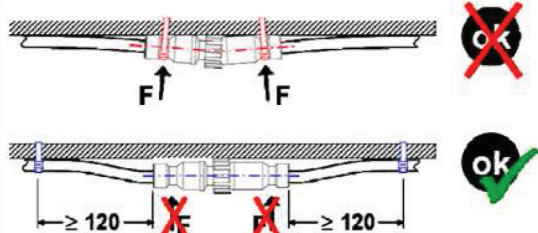


Electrical Connection / Wiring

Bayonet Connection (7-pin)

The following references apply explicitly to each application (e.g. power supply, diagnosis, splitter, etc) of the 7-pin bayonet Connection.

To avoid stress cracks, leakage and maybe corroded contacts, the following points should be considered:

<ul style="list-style-type: none"> - it must be guaranteed that in the disconnected condition the Connection is not exposed to direct exposure to rain, snow, dust, etc. 	
<ul style="list-style-type: none"> - the seal in the socket plug must be correctly fitted and show no signs of damage. 	
<ul style="list-style-type: none"> - when assembling the Connection you must feel and hear that the nut has locked. 	
<ul style="list-style-type: none"> - the bayonet Connection must be securely fixed, without tension, using cable straps ensuring that there are no bending forces created. - use as large a radius as possible during the laying of cables. - it is not necessary to create a loop for the avoidance of water entrance because the connector is a completely moulded 	
<ul style="list-style-type: none"> - the bayonet Connection must be securely fixed, without tension, using cable straps ensuring that there are no bending forces created. - use as large a radius as possible during the laying of cables 	

WABCO TEBS-E ECU Internal Failure due to Water Ingress:

(Protective caps missing from GI/O ports)

Protective caps must be installed on all GI/O ports that are not assigned to a peripheral component. GI/O ports left unprotected may be subjected to contamination and water ingress resulting in premature failure of the ECU.

Fig. 1: **Contaminated “Subsystems” Port**

Fig 1 shows the effects of a missing protective cap. The exposed port (Subsystems) has allowed an electrical short to track across the two rows of pins highlighted in the red boxed area.

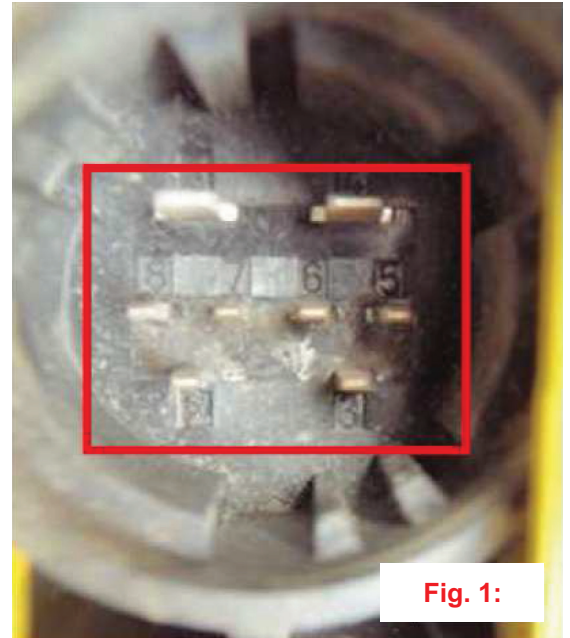
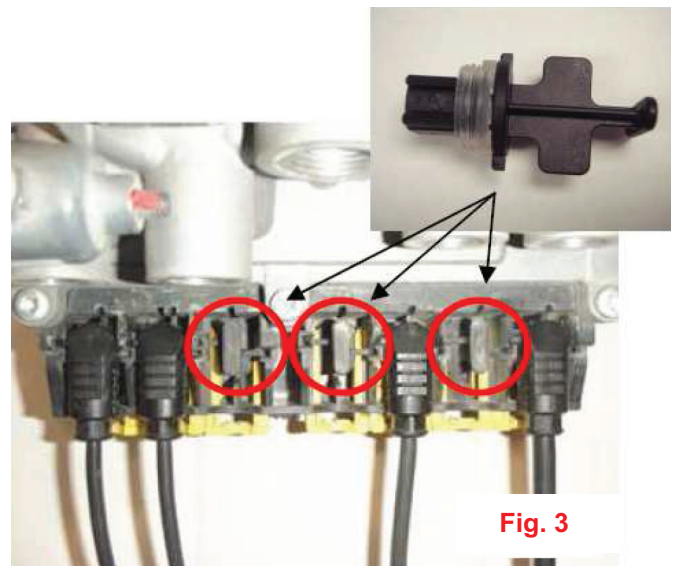
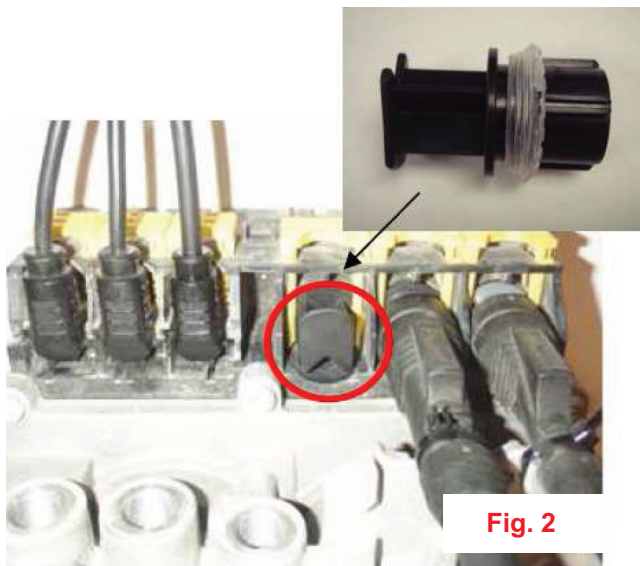


Fig. 1:

Fig. 2 and 3: **Protective Caps Installed**

Fig. 2 and 3 show a view looking up underneath the mounted ECU. There are 13 GI/O slots in total. This particular system uses 9 GI/O slots. The 4 ports not used are fitted with the protective cap.



Notes



QUALITY ASSURED

When purchasing a WABCO product, please make sure it has the typical WABCO product marks (particularly on packaging, labels and identification plate) as evidence that it is an original WABCO part. In case you have any doubts, please contact your WABCO sales partner.



a **WORLD** of
DIFFERENCE

WABCO

WABCO (NYSE: WBC) is a leading innovator and global supplier of technologies that improve the safety and efficiency of commercial vehicles.

Founded nearly 150 years ago, WABCO continues to pioneer breakthrough products and systems for braking, stability, suspension, transmission automation, and aerodynamics. Today, all of the world's leading truck, bus and trailer manufacturers have WABCO technologies onboard. In addition, WABCO provides the industry with advanced fleet management solutions and aftermarket services. WABCO reported sales of \$2.9 billion in 2014. The company is headquartered in Brussels, Belgium, and has 11,000 employees worldwide.

For more information, visit

www.wabco-auto.com



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